

Section 28 — The FUNt Universal Coherence Law (UCL)

Section 28 establishes the FUNt Universal Coherence Law (UCL), the rule that governs how systems maintain alignment, stability, and information persistence within the φ -lattice. Coherence is the ability of any structure—particle, field, atom, molecule, organism, or cosmic region—to preserve a consistent phase-curvature identity across time. UCL unifies quantum coherence, biological rhythms, EM stability, mechanical resonance, and Wave-Web synchrony.

28.1 Core Definition of UCL

- Coherence = stable phase alignment across connected φ -nodes.
- Coherence is preserved when $\Delta\Phi$, Δb , and $\Delta\tau$ remain within harmonic tolerances.
- Coherence defines stability, identity, and resonance capacity.
- Decoherence is curvature-noise exceeding harmonic tolerance windows.

28.2 Formal Expression of UCL

UCL is expressed as:

$$C = K_c \times \exp[- (\Delta\Phi^2 + \Delta b^2 + \Delta\tau^2) / (2\sigma_\varphi^2)]$$

Where:

- C = coherence magnitude
- K_c = coherence normalization constant
- $\Delta\Phi$ = phase deviation
- Δb = breathing deviation
- $\Delta\tau$ = torsion deviation
- σ_φ = φ -tolerance window

28.3 Sources of Coherence

- Stable φ -band curvature spacing.
- Balanced breathing–torsion cycles.
- Low φ -noise environments.
- Constructive Wave-Web resonance envelopes.

28.4 Sources of Decoherence

- Phase turbulence ($\Delta\Phi$ explosion).
- Torsion shocks ($\Delta\tau$ spikes).

- Environmental φ -noise (entropy injection).
- Curvature discontinuities (φ -band mismatch).

28.5 Re-Coherence Mechanism

- φ -drip into nearest stable harmonic band.
- Breathing reset via Δb minimization.
- Wave-Web global resynchronization.
- Elimination of torsion discontinuities.

28.6 Quantum Coherence Under UCL

- Superposition = multi-phase coherence.
- Entanglement = shared curvature envelope.
- Tunneling = coherence preserved across discontinuous space.
- Decoherence = φ -band collapse via noise above σ_φ .

28.7 Classical Coherence

- Mechanical resonance stability.
- Optical cavity coherence.
- Electrical phase locking.
- Acoustic standing waves.

28.8 Biological Coherence

- Neural oscillation grids.
- Cardiac rhythm entrainment.
- Cellular biophoton alignment.
- Whole-organism circadian phase cycles.

28.9 Scalar-Band Coherence

- Near φ^9 coherence becomes singular.
- Tunneling events preserve coherence despite spatial collapse.
- Reentry resets coherence into φ^6 – φ^7 bands.
- This defines identity continuity during instantaneous transitions.

28.10 Applications of UCL

- Defines stability of atoms, molecules, and living systems.
- Explains coherence bursts in astrophysical jets.
- Predicts decoherence thresholds in quantum devices.
- Unifies coherence phenomena across all scales.